FIG. 1

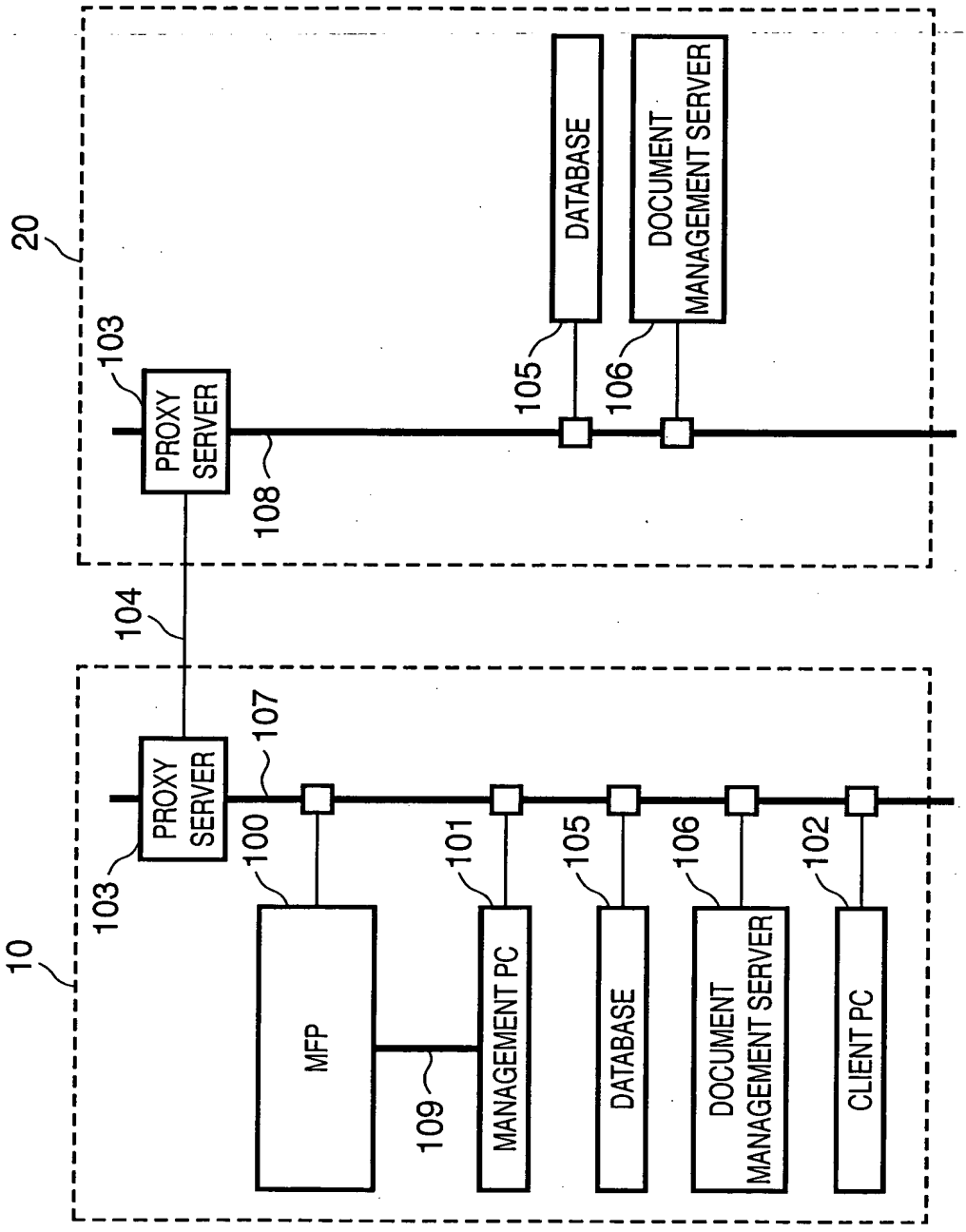

20
103
PROXY SERVER
108
105
106
DATABASE
DOCUMENT MANAGEMENT SERVER
104
10
103
PROXY SERVER
107
100
101
105
106
102
MFP
109
MANAGEMENT PC
DATABASE
DOCUMENT MANAGEMENT SERVER
CLIENT PC

FIG. 2

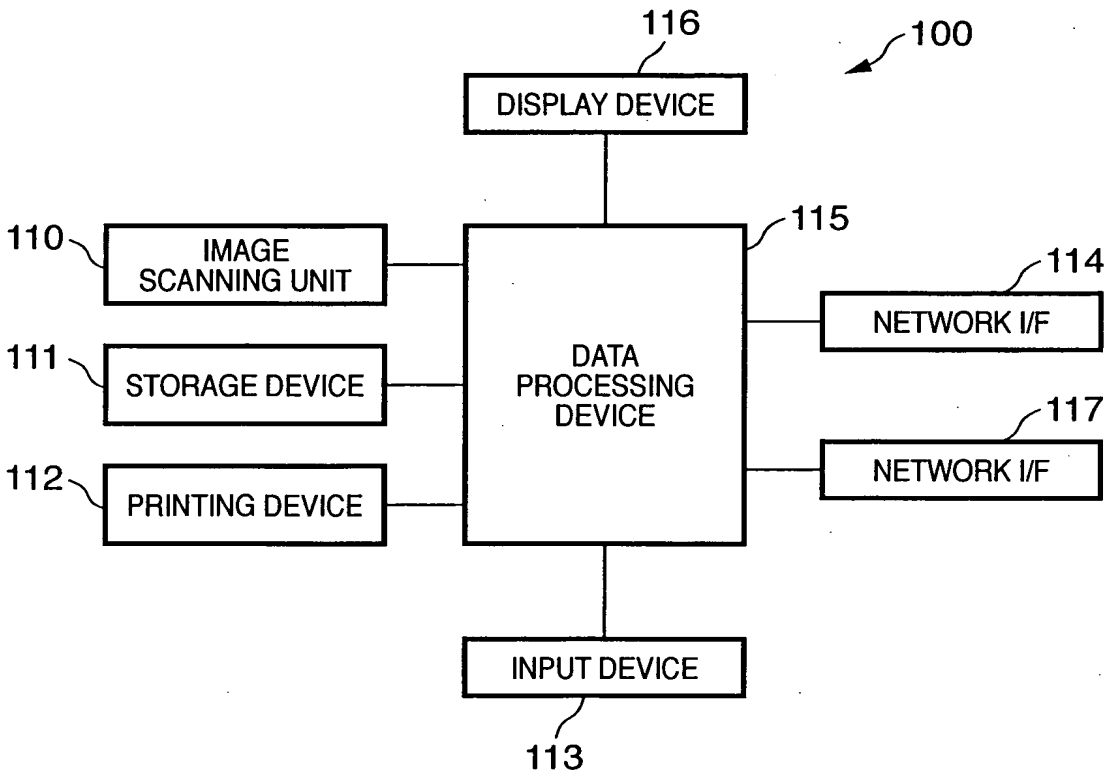

116
100
DISPLAY DEVICE
110
IMAGE SCANNING UNIT
115
114
NETWORK I/F
111
STORAGE DEVICE
DATA PROCESSING DEVICE
117
NETWORK I/F
112
PRINTING DEVICE
INPUT DEVICE
113

FIG. 3

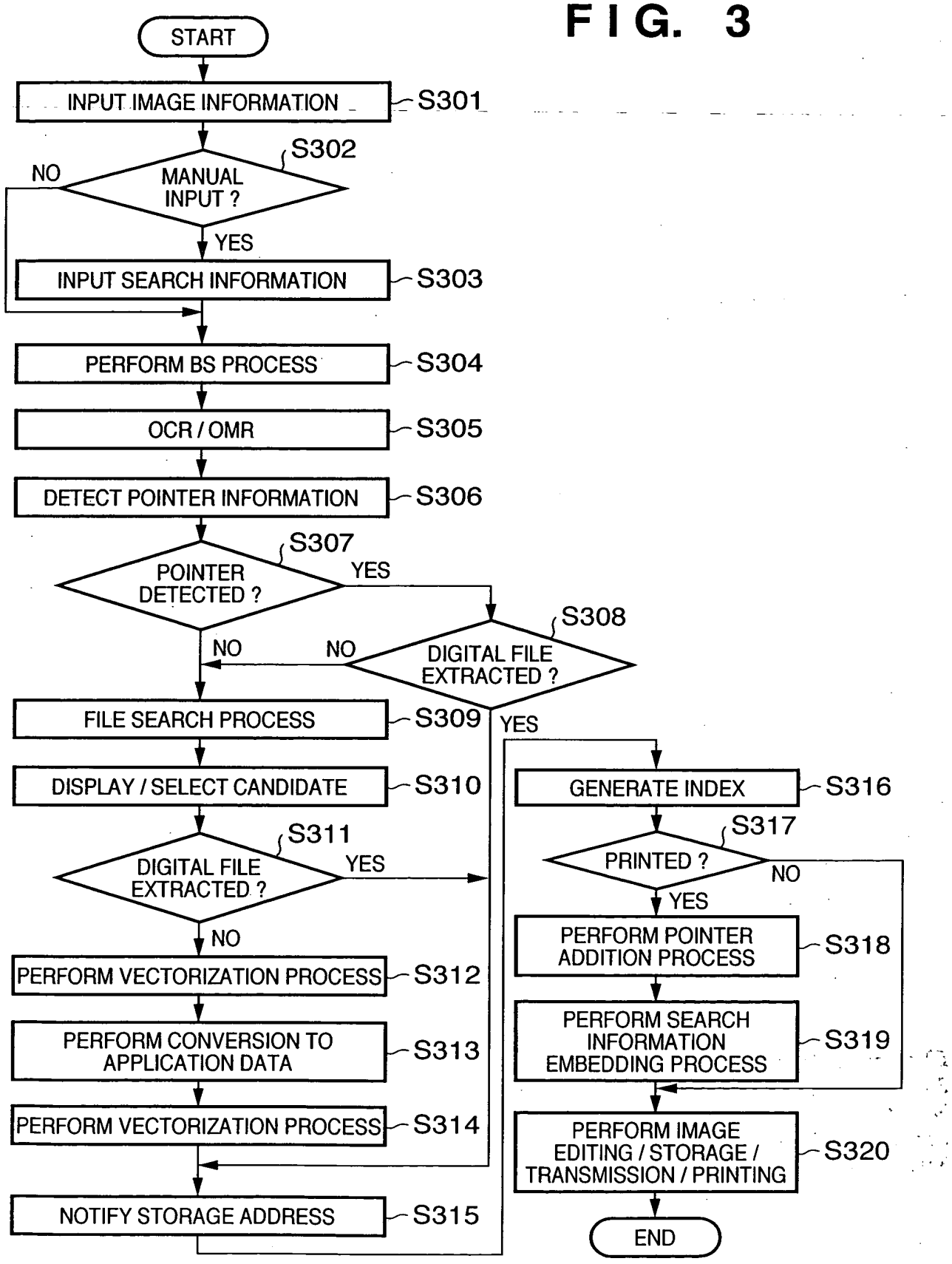

START
INPUT IMAGE INFORMATION
S301
S302
MANUAL INPUT ?
NO
YES
INPUT SEARCH INFORMATION
S303
PERFORM BS PROCESS
S304
OCR / OMR
S305
DETECT POINTER INFORMATION
S306
S307
POINTER DETECTED ?
YES
S308
DIGITAL FILE EXTRACTED ?
NO
NO
FILE SEARCH PROCESS
S309
YES
DISPLAY / SELECT CANDIDATE
S310
S311
DIGITAL FILE EXTRACTED ?
YES
NO
PERFORM VECTORIZATION PROCESS
S312
PERFORM CONVERSION TO APPLICATION DATA
S313
PERFORM VECTORIZATION PROCESS
S314
NOTIFY STORAGE ADDRESS
S315
GENERATE INDEX
S316
S317
PRINTED ?
NO
YES
PERFORM POINTER ADDITION PROCESS
S318
PERFORM SEARCH INFORMATION EMBEDDING PROCESS
S319
PERFORM IMAGE EDITING / STORAGE / TRANSMISSION / PRINTING
S320
END

FIG. 4

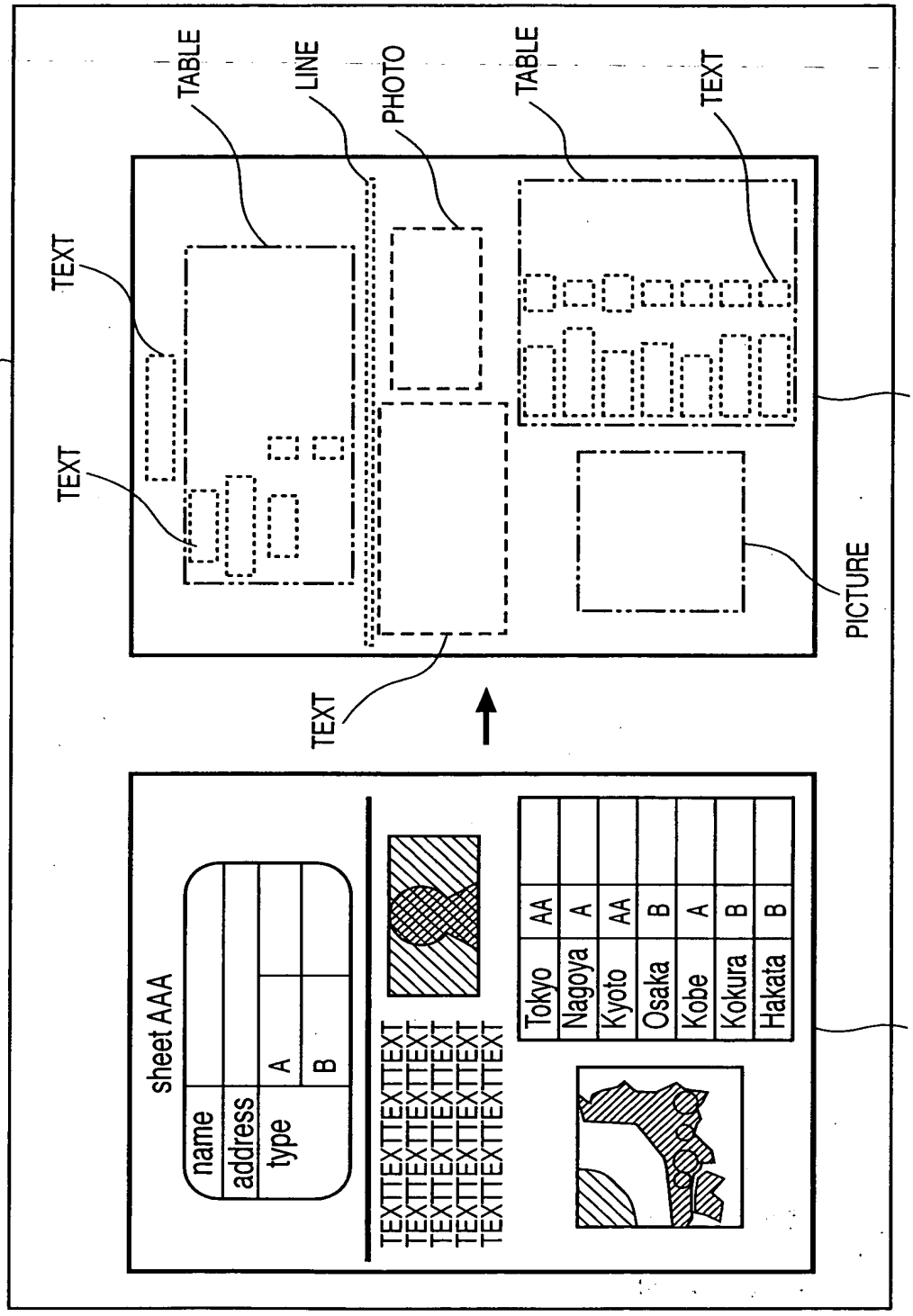

116
TABLE
LINE
PHOTO
TABLE
TEXT
TEXT
TEXT
TEXT
PICTURE
42
sheet AAA
name
address
type
A
B
TEXTTEXTTEXTTEXT
TEXTTEXTTEXTTEXT
TEXTTEXTTEXTTEXT
TEXTTEXTTEXTTEXT
TEXTTEXTTEXTTEXT
Tokyo AA
Nagoya A
Kyoto AA
Osaka B
Kobe A
Kokura B
Hakata B
41

FIG. 5

BLOCK INFORMATION

	PROPERTY	COORDINATE X	COORDINATE Y	WIDTH W	HEIGHT H	OCR INFORMATION
BLOCK 1	1	X1	Y1	W1	H1	AVAILABLE
BLOCK 2	3	X2	Y2	W2	H2	AVAILABLE
BLOCK 3	2	X3	Y3	W3	H3	NOT AVAILABLE
BLOCK 4	1	X4	Y4	W4	H4	AVAILABLE
BLOCK 5	3	X5	Y5	W5	H5	AVAILABLE
BLOCK 6	5	X6	Y6	W6	H6	NOT AVAILABLE

PROPERTY 1 : text 2 : picture 3 : table 4 : line 5 : photo

INPUT FILE INFORMATION

TOTAL NUMBER OF BLOCKS	N (=6)

FIG. 6

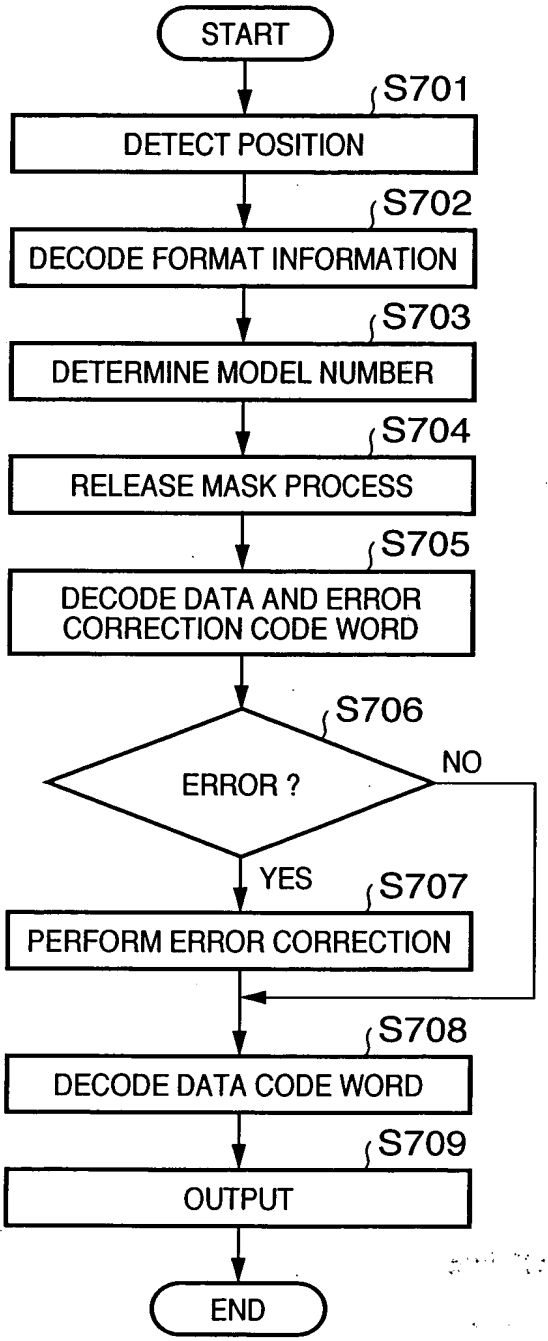

START
S701
DETECT POSITION
S702
DECODE FORMAT INFORMATION
S703
DETERMINE MODEL NUMBER
S704
RELEASE MASK PROCESS
S705
DECODE DATA AND ERROR CORRECTION CODE WORD
S706
ERROR ?
NO
YES
S707
PERFORM ERROR CORRECTION
S708
DECODE DATA CODE WORD
S709
OUTPUT
END

FIG. 7

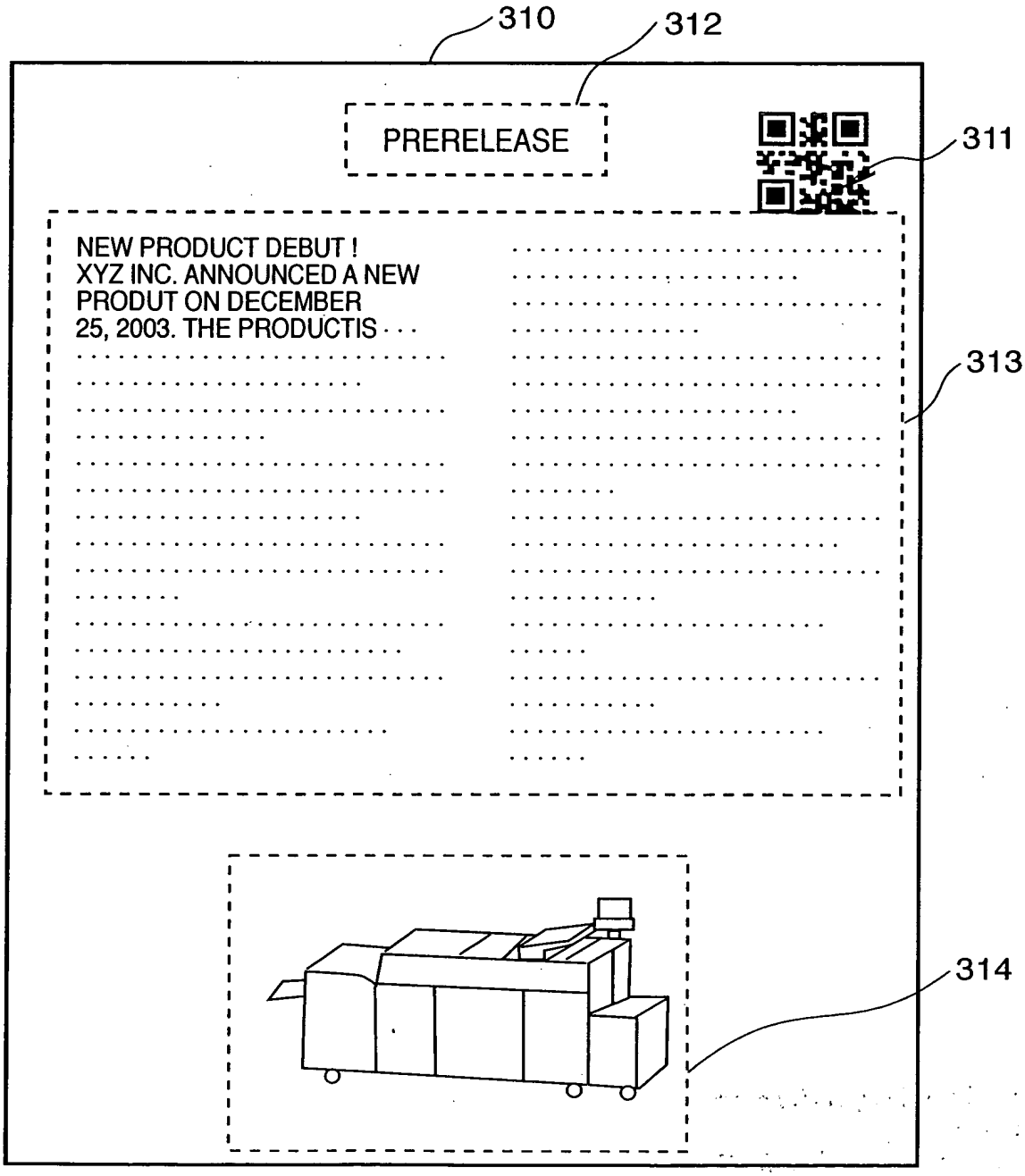

310
312
PRERELEASE
311
NEW PRODUCT DEBUT !
XYZ INC. ANNOUNCED A NEW
PRODUT ON DECEMBER
25, 2003. THE PRODUCTIS
313
314

FIG. 8

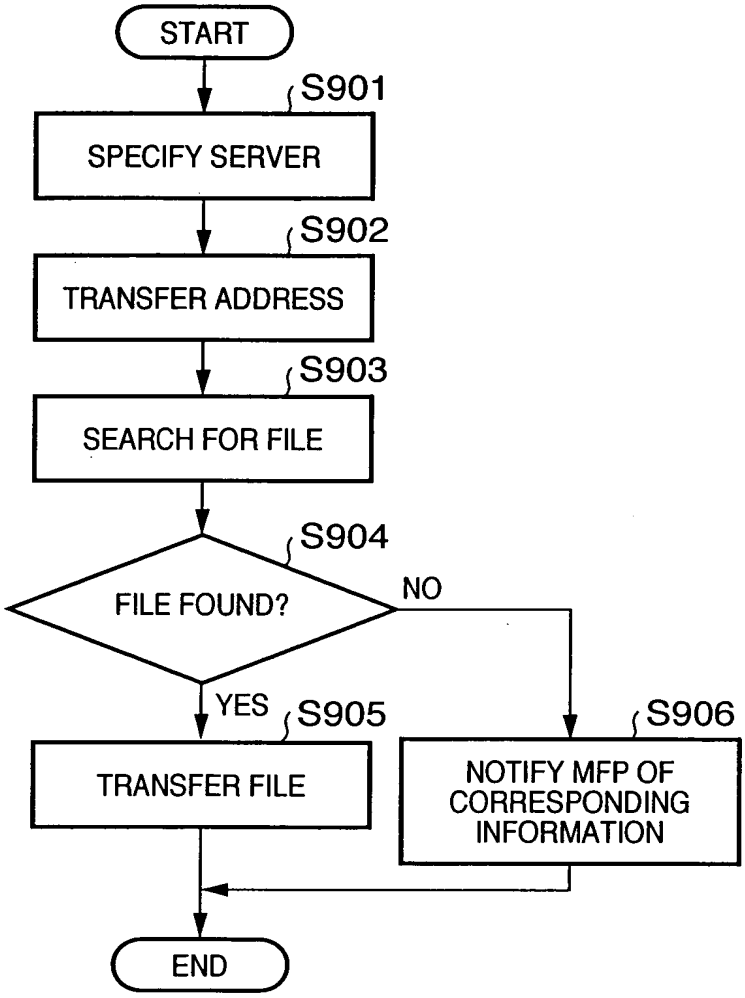

START
S901
SPECIFY SERVER
S902
TRANSFER ADDRESS
S903
SEARCH FOR FILE
S904
FILE FOUND?
NO
YES
S905
TRANSFER FILE
S906
NOTIFY MFP OF CORRESPONDING INFORMATION
END

FIG. 9

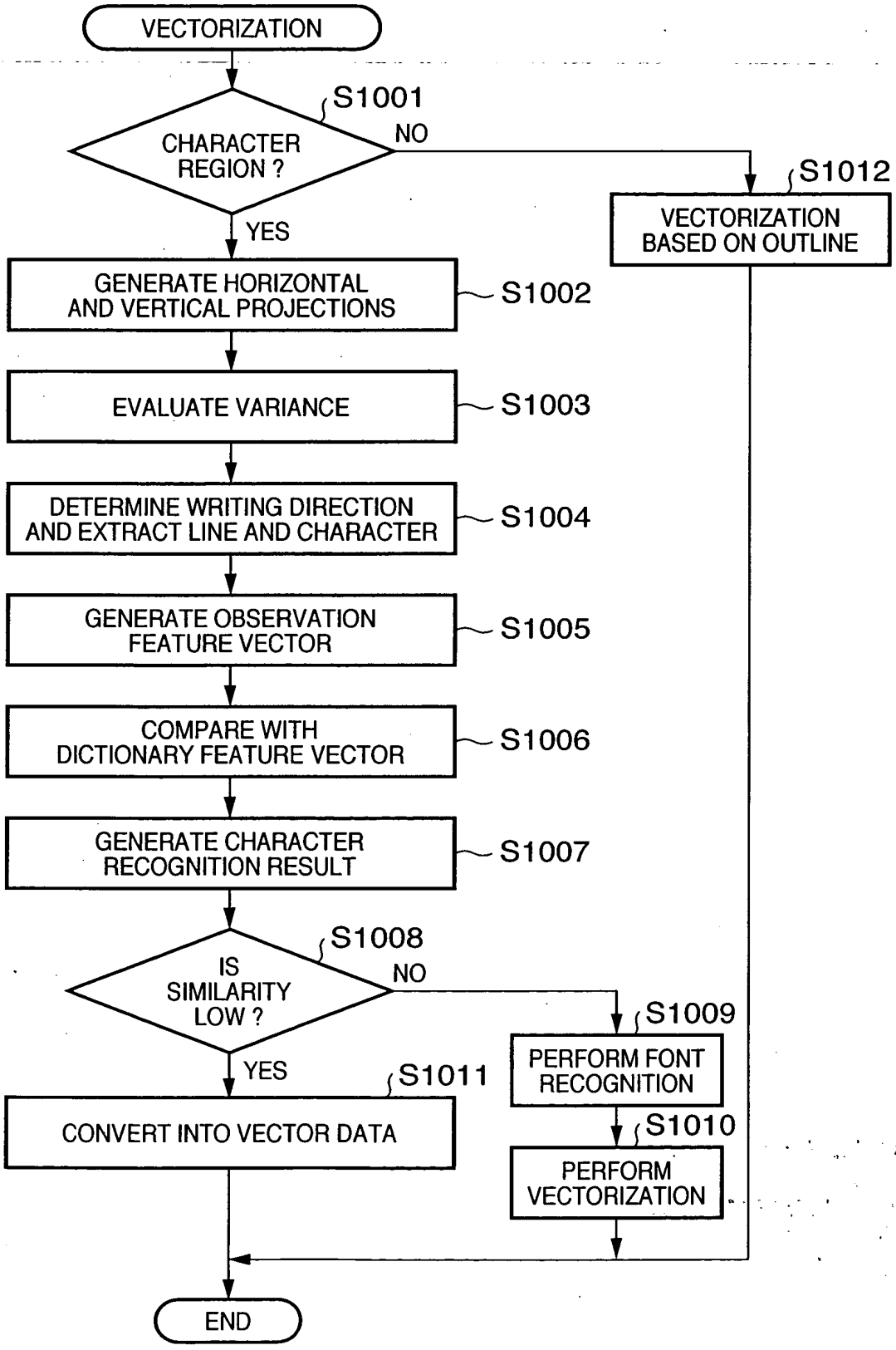

VECTORIZATION
S1001
CHARACTER REGION ?
NO
S1012
VECTORIZATION BASED ON OUTLINE
YES
GENERATE HORIZONTAL AND VERTICAL PROJECTIONS
S1002
EVALUATE VARIANCE
S1003
DETERMINE WRITING DIRECTION AND EXTRACT LINE AND CHARACTER
S1004
GENERATE OBSERVATION FEATURE VECTOR
S1005
COMPARE WITH DICTIONARY FEATURE VECTOR
S1006
GENERATE CHARACTER RECOGNITION RESULT
S1007
S1008
IS SIMILARITY LOW ?
NO
S1009
PERFORM FONT RECOGNITION
S1010
PERFORM VECTORIZATION
YES
S1011
CONVERT INTO VECTOR DATA
END

FIG. 10

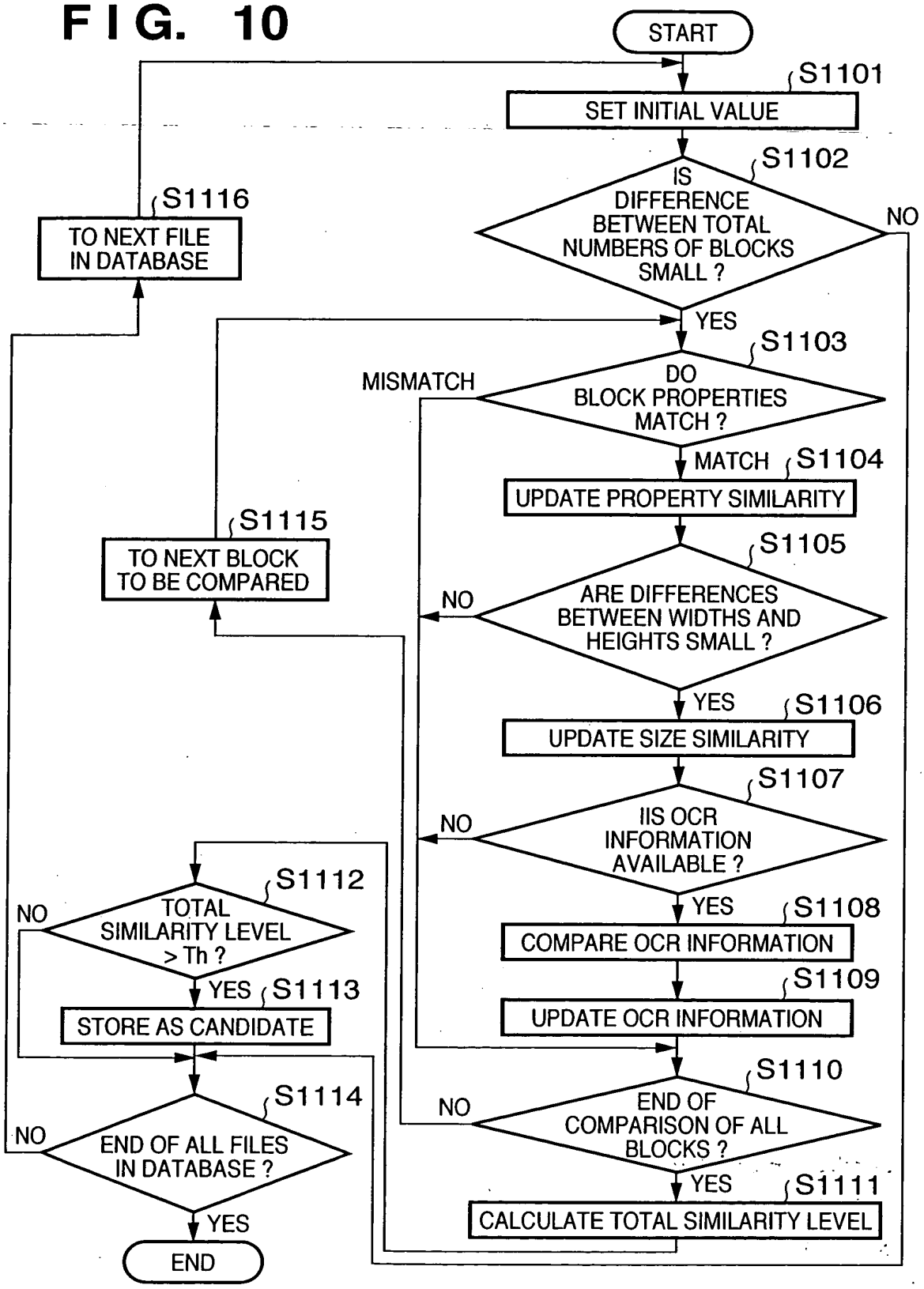

START
S1101
SET INITIAL VALUE
S1102
IS DIFFERENCE BETWEEN TOTAL NUMBERS OF BLOCKS SMALL ?
NO
YES
S1103
DO BLOCK PROPERTIES MATCH ?
MISMATCH
MATCH
S1104
UPDATE PROPERTY SIMILARITY
S1105
ARE DIFFERENCES BETWEEN WIDTHS AND HEIGHTS SMALL ?
NO
YES
S1106
UPDATE SIZE SIMILARITY
S1107
IIS OCR INFORMATION AVAILABLE ?
NO
YES
S1108
COMPARE OCR INFORMATION
S1109
UPDATE OCR INFORMATION
S1110
END OF COMPARISON OF ALL BLOCKS ?
NO
YES
S1111
CALCULATE TOTAL SIMILARITY LEVEL
S1112
TOTAL SIMILARITY LEVEL > Th ?
NO
YES
S1113
STORE AS CANDIDATE
S1114
END OF ALL FILES IN DATABASE ?
NO
YES
END
S1115
TO NEXT BLOCK TO BE COMPARED
S1116
TO NEXT FILE IN DATABASE

FIG. 11

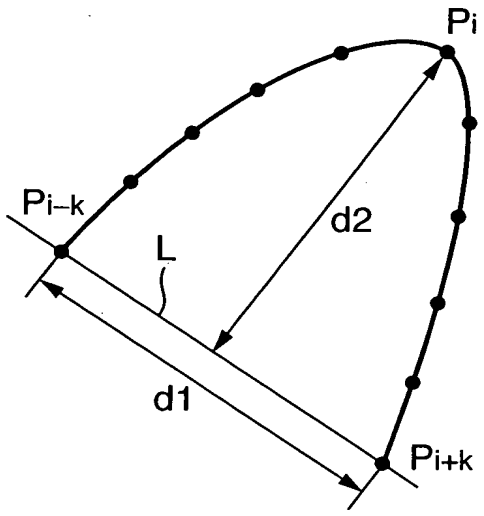


FIG. 12

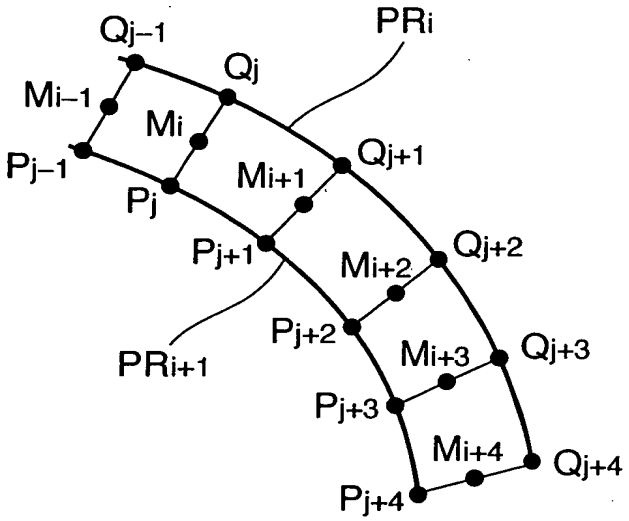

Qj−1
PRi
Qj
Mi−1
Mi
Qj+1
Pj−1
Mi+1
Pj
Pj+1
Qj+2
Mi+2
Pj+2
PRi+1
Mi+3
Qj+3
Pj+3
Mi+4
Qj+4
Pj+4

FIG. 13

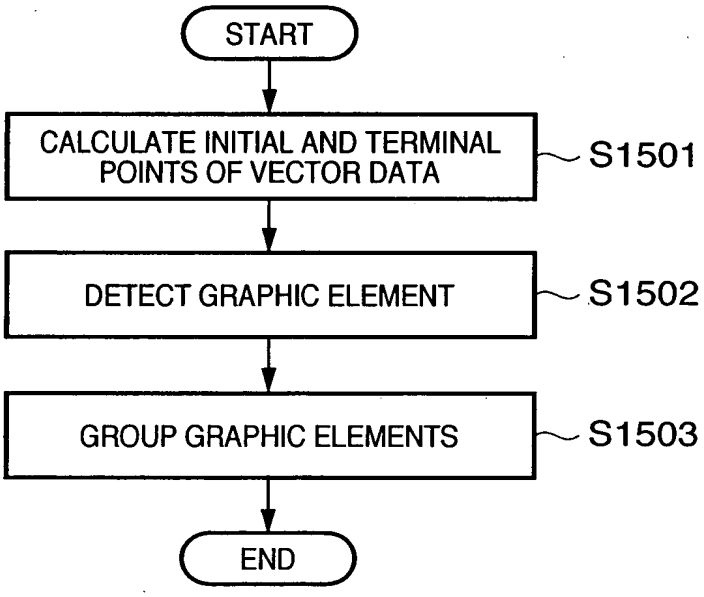

START
CALCULATE INITIAL AND TERMINAL POINTS OF VECTOR DATA
S1501
DETECT GRAPHIC ELEMENT
S1502
GROUP GRAPHIC ELEMENTS
S1503
END

FIG. 14

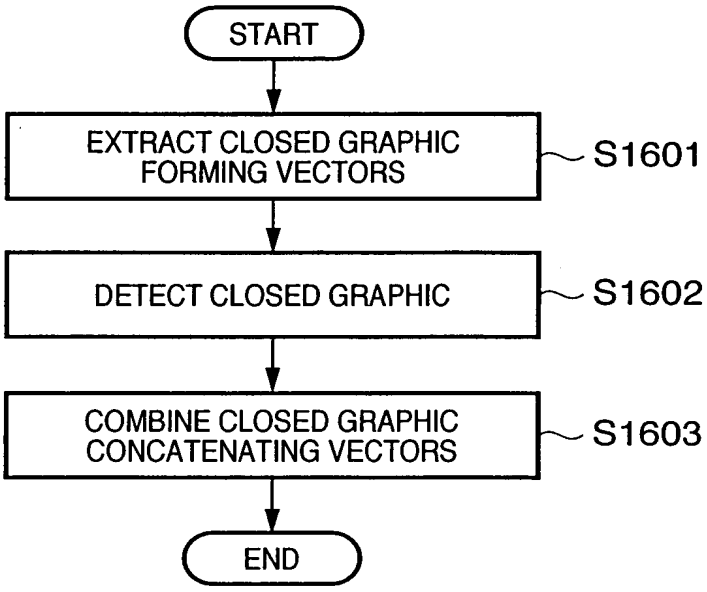

START
EXTRACT CLOSED GRAPHIC FORMING VECTORS
S1601
DETECT CLOSED GRAPHIC
S1602
COMBINE CLOSED GRAPHIC CONCATENATING VECTORS
S1603
END

FIG. 15

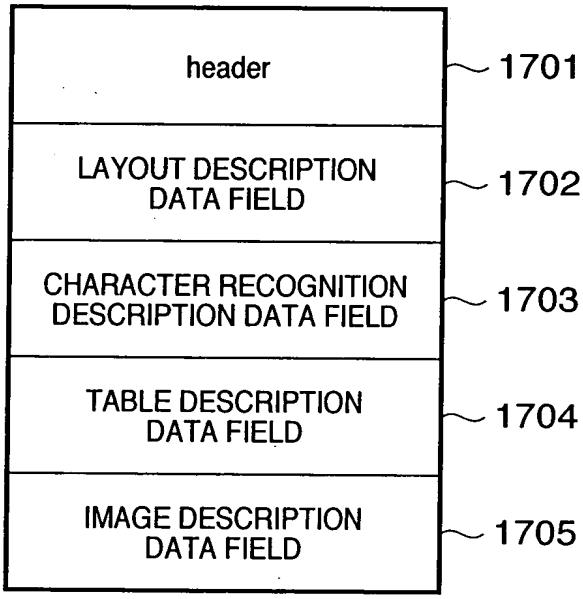

header
1701
LAYOUT DESCRIPTION DATA FIELD
1702
CHARACTER RECOGNITION DESCRIPTION DATA FIELD
1703
TABLE DESCRIPTION DATA FIELD
1704
IMAGE DESCRIPTION DATA FIELD
1705

FIG. 16

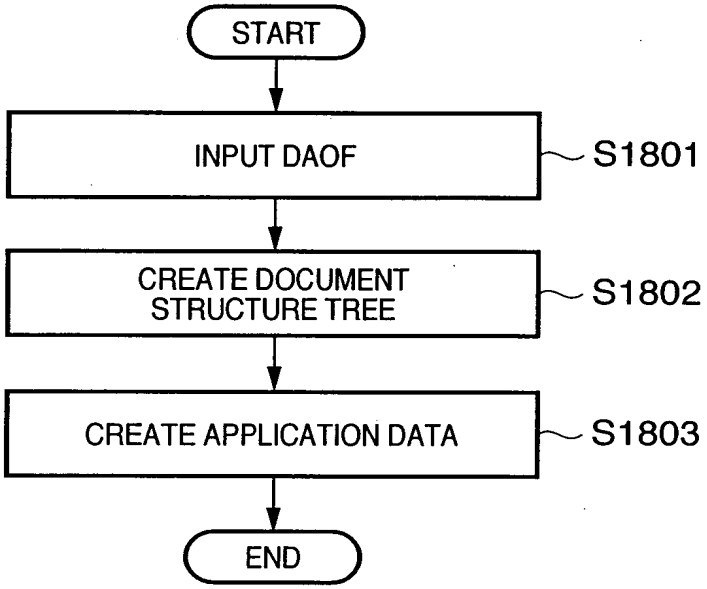

START
INPUT DAOF
S1801
CREATE DOCUMENT STRUCTURE TREE
S1802
CREATE APPLICATION DATA
S1803
END

FIG. 17

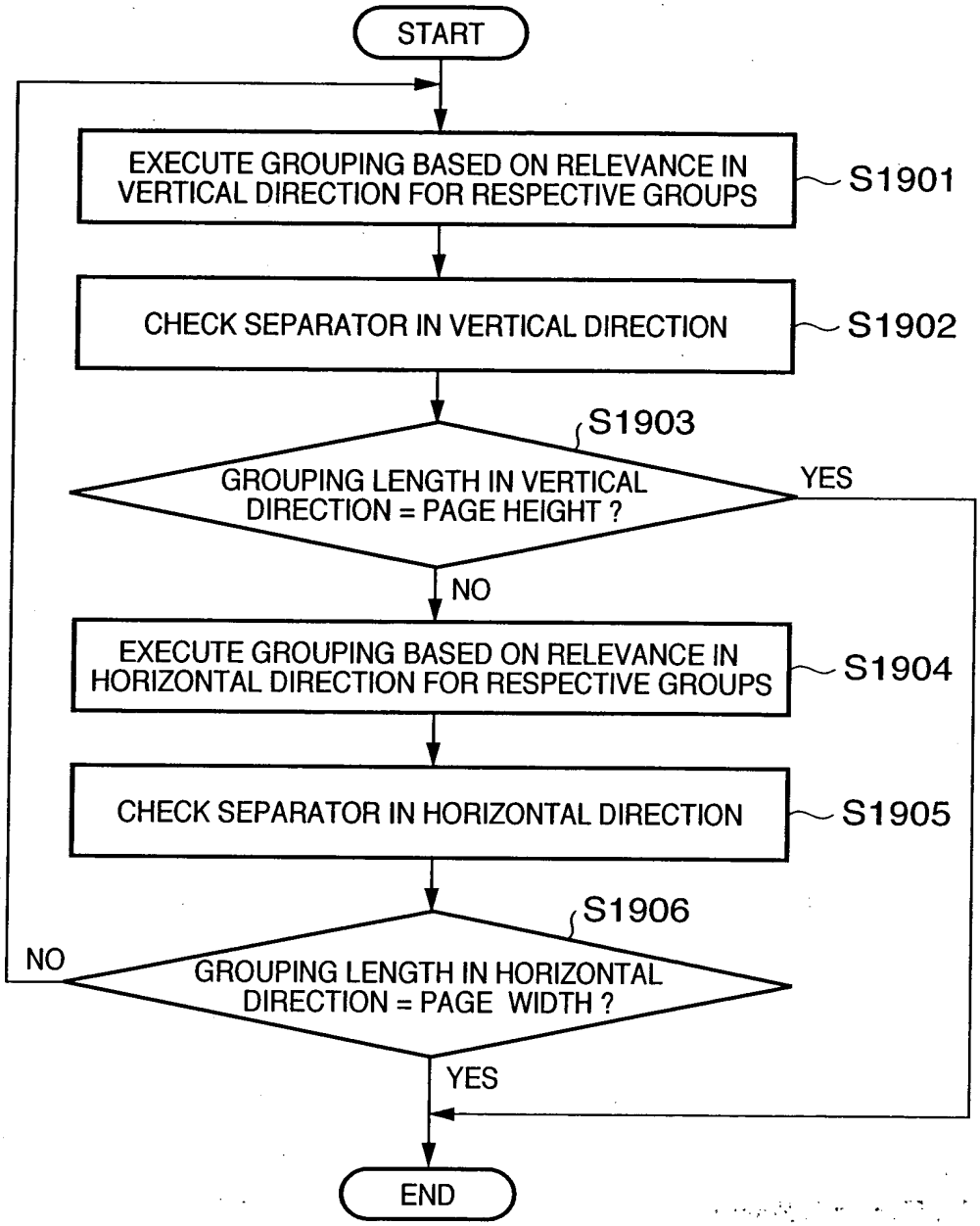

START
EXECUTE GROUPING BASED ON RELEVANCE IN VERTICAL DIRECTION FOR RESPECTIVE GROUPS
S1901
CHECK SEPARATOR IN VERTICAL DIRECTION
S1902
S1903
GROUPING LENGTH IN VERTICAL DIRECTION = PAGE HEIGHT ?
YES
NO
EXECUTE GROUPING BASED ON RELEVANCE IN HORIZONTAL DIRECTION FOR RESPECTIVE GROUPS
S1904
CHECK SEPARATOR IN HORIZONTAL DIRECTION
S1905
S1906
NO
GROUPING LENGTH IN HORIZONTAL DIRECTION = PAGE WIDTH ?
YES
END

FIG. 18

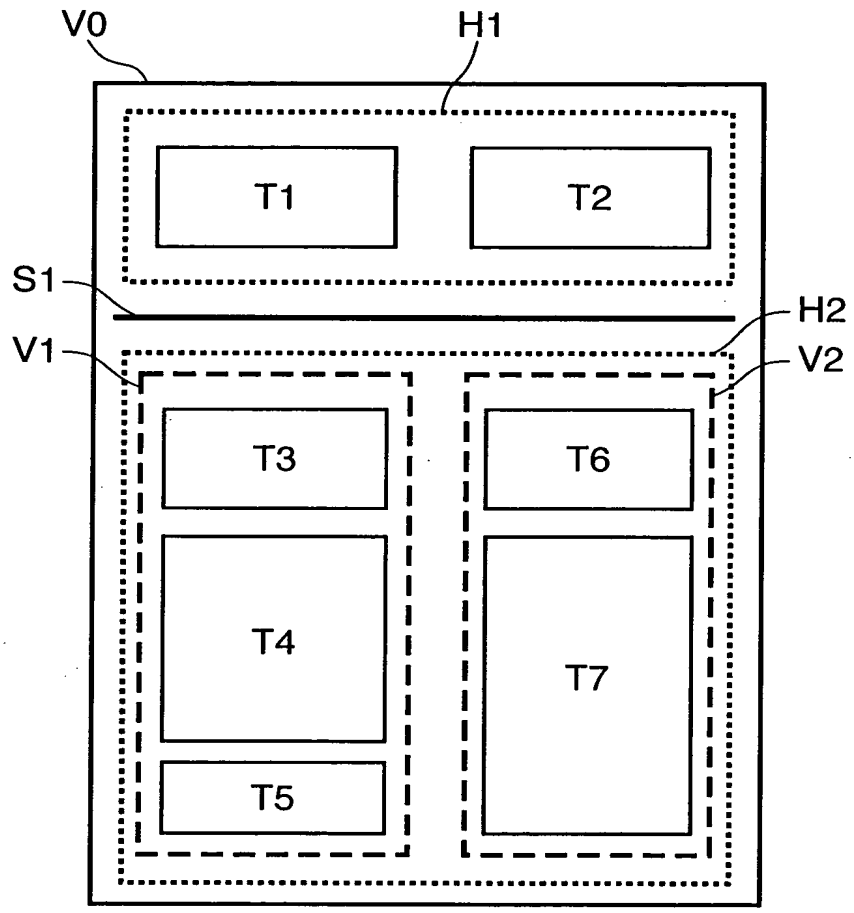


FIG. 19

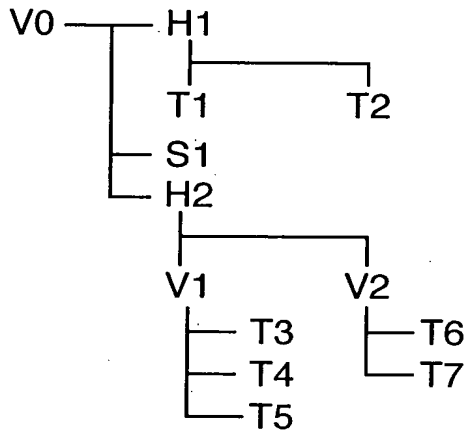
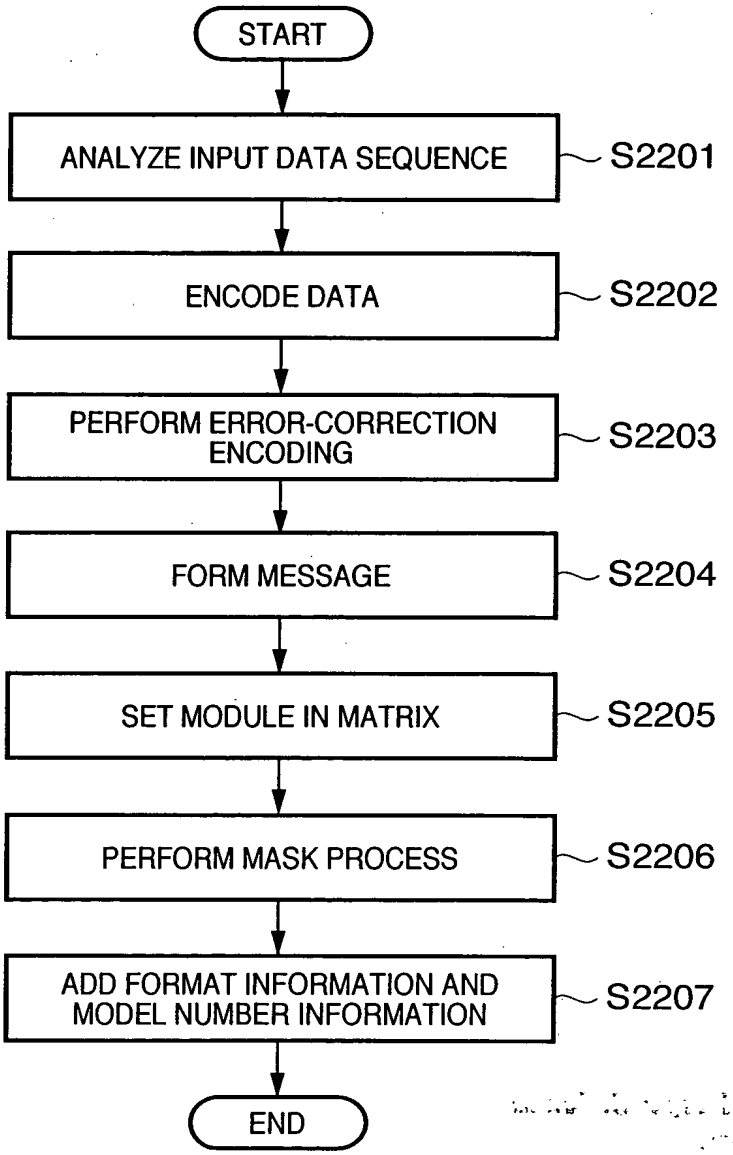


FIG. 20


START
ANALYZE INPUT DATA SEQUENCE
S2201
ENCODE DATA
S2202
PERFORM ERROR-CORRECTION ENCODING
S2203
FORM MESSAGE
S2204
SET MODULE IN MATRIX
S2205
PERFORM MASK PROCESS
S2206
ADD FORMAT INFORMATION AND MODEL NUMBER INFORMATION
S2207
END